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(12) # EUROPEAN PATENT APPLICATION

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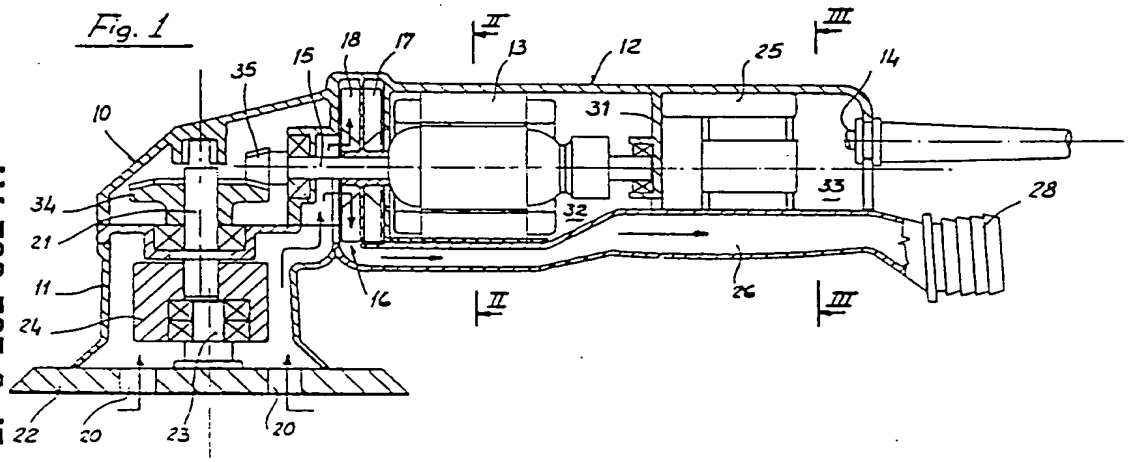
(54) **Manual electrical tool with motor and dust suction means incorporated in the handle.**

(57) The manual electric tool comprises a work head (10), a handle (12) extending radially from said work head (10) and a motor (13) housed in said handle. There is provided a fan (18) placed at the end of the handle (12) turned toward the work head (10) to suck in the dust generated by the work and convey it into a discharge duct (26) for the sucked dust. Said discharge duct (26) is preferably incorporated in said handle (12).

Fig. 1




EP 0 252 552 A1

# "Manual electrical tool with motor and dust suction means incorporated in the handle"

The present invention relates to a manual electrical tool such as for example a honing or lapping machine, with a motor and dust suction means incorporated in the handle.

Manual electrical tools having the motor and related cooling fan housed in the handle instead of in the work head are well known to those skilled in the art.

This arrangement has the merit of offering better handling of the tool since the motor is held in the user's hand and thus affords effective balancing of weights.

Many honing and lapping machines are equipped with an abrasive plate having holes communicating with a duct designed for suction of the dust produced during work and connected directly to an external aspirator.

In this manner the dust produced during work is immediately removed and does not interfere with the honing operation, clogging the space between the surface of the work and the abrasive plate and disturbing the operator.

Dependence of said tools on the external aspirator is often an obstacle to the convenience of use which they must have. As their main feature is portability, hence small size, the aspirator constitutes a cumbersome added element which must necessarily follow the tool to which it is connected when the latter is moved from one work place to another.

In view of this state of the art the object of the present invention is to obviate said shortcomings by making a manual electrical tool of the type having a motor housed in the handle and having improved means of evacuation of the dust produced by the work.

To achieve said object in accordance with the present invention it was sought to make a manual electrical tool of the type comprising a work head, a handle extending radially from said work head, and a motor housed in said handle characterized in that it also includes a fan to suck in the dust generated by the work and convey it into a discharge duct for sucked dust, said fan being placed on the output shaft of the motor at the end of the handle turned toward the work head.

Also preferably the dust discharge duct is incorporated in the handle beside said motor.

With this arrangement the fan turns at the same speed as the motor output shaft, creating in the work head the vacuum necessary for complete and rapid evacuation of the dust from the work area.

The external aspirator is thus eliminated while the position of the fan and the dust discharge duct in the handle contains the size of the tool.

The structural and functional characteristics of the invention and its advantages in comparison with the known art will appear more clearly from an examination of the following description with reference to the schematic drawings annexed which show an example of practical application of the invention.

In the drawings:

FIG. 1 is a vertical longitudinal cross section illustrating an orbital honing machine in conformity with the innovative principle of the invention,

FIG. 2 is a cross section along line II-II of FIG. 1, and

FIG. 3 is a cross section along line III-III of FIG. 1.

Referring to the drawings the orbital honing machine illustrated therein is structurally formed of a work head 10 from which extends a radial handle 12 made in an overturned-U boxed form as shown in FIG. 3.

The upper part of the handle 12 is divided by an intermediate baffle 31 into a front space 32 and a rear space 33. In the first is housed an electric motor 13 on the output shaft of which are keyed two integral fans 17, 18 the first of which is designed to cool the motor 13 and the second of which is designed to suck the dust produced by the honing operation following the path indicated by the arrows in FIG. 1. In accordance with another embodiment (not shown) said fans 17 and 18 can also be separated. In the rear space 33 are housed an electric cable 14 and electric devices designed to control the motor 13.

In the lower part of the handle 12 is also included a discharge duct 26 for the dust produced during work the cross section area of which is small beneath the motor 13 and larger beneath the rear space 33 of said handle (FIGS. 2 and 3) where the duct 26 acts as a bottom closing element for said handle.

Alternatively the handle 12 can be closed below by an intermediate baffle and the duct 26 is in this case simply affixed thereto.

The handle can also have a configuration different from the essentially straight one shown only as a nonlimiting example.

The duct 26 terminates with a saw-toothed connection 28 for a flexible exhaust tube to convey the exhausted dust into a collecting container. To the connection 28 there can also be directly applied a dust collection bag of flexible material.

The work head 10 comprises an external body 11 within which is housed in the conventional manner a mechanism for transmission of the motion of the shaft 15 of the motor 13 to a plate 22 having suction holes 20 and on which can be applied a sheet of abrasive paper (not shown). More specifically the plate 22 is fixed to a shaft 23 born in a turning manner by an excentric hub 24 fixed to a shaft 21 made to rotate by the shaft 15 of the motor 13 through a pair of gears 34 and 35.

In accordance with the present invention the honing dust is sucked in by the fan 18 through the holes 20 in the plate 22 and fed into the discharge duct 26. Then the dust is discharged outside the tool.

## Claims

1. Manual electric tool comprising a work head (10), a handle (12) extending radially from said work head (10) and a motor (13) housed in said housing (12) characterized in that it also comprises a fan (18) to suck in the dust generated by the work and convey it into a discharge duct (26) for the sucked dust, said fan (18) being placed on the output shaft of the motor (13) at the end of the handle (12) turned toward the work head (10).

2. Tool in accordance with claim 1 characterized in that said discharge duct (26) is incorporated in said handle (12) beside said motor (13).

3. Tool in accordance with claim 2 characterized in that at least a part of said handle (12) has a box structure with an overturned U cross section closed below by said discharge duct (26).

4. Tool in accordance with claim 3 characterized in that said handle (12) above said discharge duct (26) is divided by an intermediate baffle (31) into a front space (32) containing said motor (13) and a rear space (33) containing an electric supply cable (14) and other electrical devices (25).

5. Tool in accordance with claim 1 characterized in that said fan (18) is integral with another fan (17) designed to cool the motor (13).

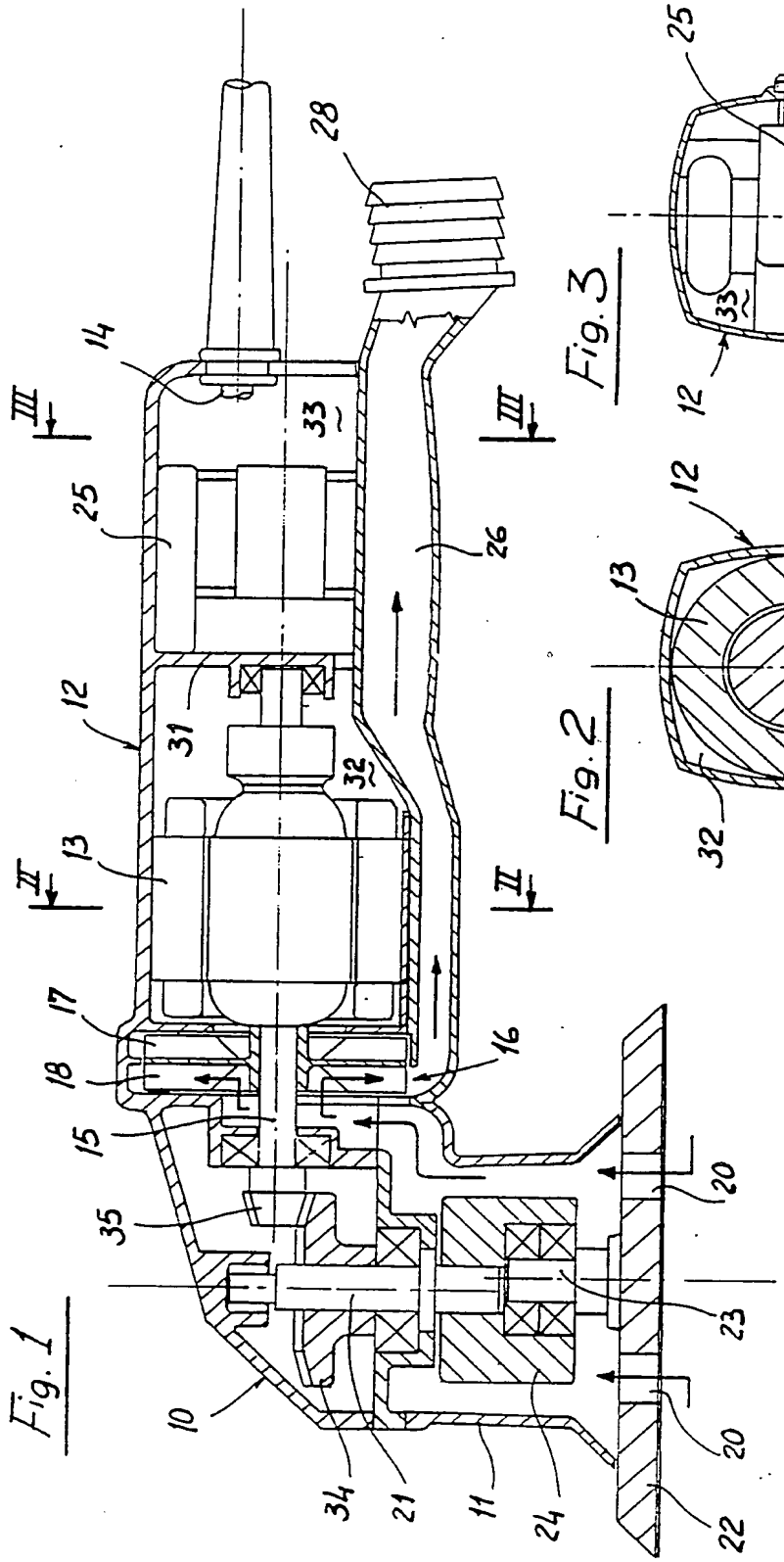



Fig. 1

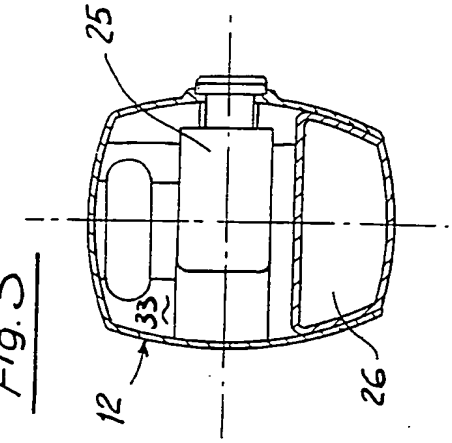



Fig. 3

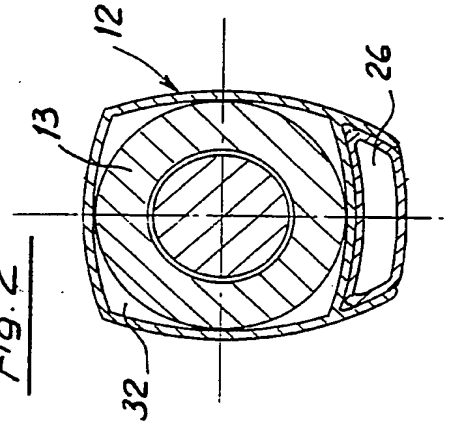



Fig. 2

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# EUROPEAN SEARCH REPORT

Application number
EP 87 20 1209

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
|---|---|---|---|
| X | US-A-2 104 436 (PATTISON et al.)<br>* claims 1-3; figures 1-3 * | 1 | B 24 B 55/10 |
| A | DE-A-3 038 489 (FESTO-MASCHINEN FABRIK G. STOLL)<br>* claims 1-5; figures 1-4 * | 1-3 | |
| A | FR-A-2 365 411 (ROBERT)<br>* claims 1-3; figures 1-2 * | 1 | |
| A | DE-U-7 001 891 (MÜLLER)<br>* claim 1; figure * | 1 | |
| A | DE-B-1 189 405 (LUTZ)<br>* claims 1-2; column 2, lines 19-33; figures 1-4 * | 1,5 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 24 B 55/00
B 24 B 23/02

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| BERLIN | 29-09-1987 | BERNAS Y.N.E. |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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